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ABSTRACT

This document is intended to help practitioners and researchers in the United Kingdom find and use Internet-based research resources dealing with raising achievement. The introduction discusses the state of research into school effectiveness in the United Kingdom and elsewhere. Part A, which reviews available World Wide Web sites devoted to research on school effectiveness and raising academic achievement, discusses the following types of Web sites: intergovernmental and international; regional and national (including Web sites in Europe, the United States, Australia, and New Zealand); and institutional. Part B examines the following topics related to postsecondary education research in the United States: (1) the U.S. postsecondary education system (organization, structure, transfer to postsecondary education); (2) student achievement and success; (3) underprepared students and remediation; (4) basic skills; (5) teaching and learning; and (6) research methodologies. Part C presents lessons pertaining to the following issues that have been distilled from the U.S. research: (1) developmental programs and underprepared students; (2) basic math skills; (3) the impact of modularization on retention; (4) research methodology; (5) maintaining links to useful Web sites; and (6) disseminating further

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education research conducted in the United Kingdom through ERIC. (Contains 53 references and 31 selected Web sites.) (MN)

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## the agency comments

# www.raising achievement

## Internet research resources on raising achievement in post-compulsory education

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**Note**
The Learning and Skills Development Agency was formerly known as FEDA.

**Raising Quality and Achievement Programme**
Run by the Learning and Skills Development Agency in partnership with the Association of Colleges (AoC).

- We aim to reach all colleges and all levels of staff.
- We offer extra support to colleges that are receiving Standards Fund money to improve their practice.
- All our activity themes are backed by a programme of research and evaluation.
- The Raising Quality and Achievement Programme is sponsored by the DfEE and all activities are subsidised.

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# Introduction

## Aims and intended outcomes

This report aims to help practitioners and researchers find and use internet-based research resources which deal with raising achievement. It provides:

- a guide to sources of research and useful organisations accessible via the internet (Part A)
- an introductory synthesis of relevant research findings drawn from the Educational Resources Information Center (ERIC) database (Part B)
- suggestions concerning the application of American research findings to raising achievement in the UK (Part C).

Part A reviews a broad range of websites from those of international agencies such as UNESCO to individual institutions such as Bunker Hill Community College.

As the amount of information available on the worldwide web continues to expand, it is increasingly difficult to find relevant, useful information. Search engines are of limited use because they are largely geared to recall rather than precision. While their search algorithms are becoming more sophisticated (relevance ranking, 'more like this', proximity, etc), the sheer volume of information usually results in the requirement to view several pages of references and browse many irrelevant links before useful information is retrieved. The use of links and organisational networks can be a more effective way of locating relevant information with greater precision although with the inevitable compromise to recall. Part A attempts to provide a structural framework and search strategy for locating relevant information.

Part B is a short synthesis of a selection of recent articles retrieved from a search on the ERIC database for literature on academic achievement in post-secondary education. The selection of articles included in the synthesis represents a small proportion of the information abstracted on the ERIC site. Articles were selected according to the degree to which they fulfilled some or all of four criteria:

- They are in themselves syntheses of other research.
- They use empirical methods to support their research findings.
- Authors have status within the US post-secondary research community based on their output and their frequency of co-citation.
- The articles have been published relatively recently (within the last six years).

Part C suggests how certain research findings in America might be relevant both to practitioners and to researchers in the UK.

### Context

In comparison with research into effectiveness in the UK schools sector, there has until relatively recently been little research on 'what works' in raising student achievement and success within the UK FE system. Much of the research published in UK journals – *Journal of Further and Higher Education* and *Research in Post-Compulsory Education*, for example – has little direct relevance to practitioners seeking to apply research findings to raising levels of student success. As Bates et al (1997) argue, 'researchers have perhaps been too governed by the policy evaluation and policy critique over the last 20 or so years' , although their proposed alternative, 'research in the field to re-focus on democratic and social justice imperatives as distinct from the economic imperative which has dominated the post-compulsory sector', would seem to offer little to practitioners keen to apply the findings of evidence-based research in their own work.

On the other hand, many of the practitioner-focused research and development projects aimed at the implementation of new curriculum initiatives lack methodological rigour. Best practice tends to 'emerge' and the generalisability and transfer of findings is problematic given the diversity of FE institutions and, perhaps more importantly, the diversity of students.

Over the last few years the involvement of practitioners from across the FE sector in a series of Learning and Skills Development Agency-sponsored projects aimed at improving, first, retention and, now, student achievement, has led to the development of a large body of evidence-based practice on what appears to make a difference in raising levels of student success (Martinez, 1997, 2000). While there is still some way to go to improve the reliability and validity of projects like these, the scale of involvement (over 30 per cent of FE sector colleges) has led to the generalisation and subsequent implementation of the research findings in many areas of curriculum delivery and student support.

Furthermore, the projects have acted as a catalyst to the development of institutional research capacity in a number of colleges, where the practitioner-focused, action research bug is now beginning to bite, often with some considerable beneficial impact on student outcomes.

In the absence of a strong evidence-informed tradition within UK FE research, the findings of research carried out in the post-secondary education sectors of other countries would seem to offer possible lessons for further research and practice. However, although many countries – including Australia, Canada, the USA, the Netherlands and the UK – have a strong tradition of research into school effectiveness, it would appear from the literature that, up until very recently, only in North America has research into post-secondary effectiveness been conducted on any major scale. The importance placed in the US post-secondary system of providing practitioners with findings from research is perhaps underlined by the number of US colleges which have a function called Institutional Research (or similar).

The ERIC database contains an extensive literature on post-secondary education originating largely in the United States. This US knowledge base has the potential to provide a rich source of ideas, practical findings and possibly collaborative opportunities to extend and develop the quality of student outcomes in the UK. There are context-specific issues arising from the different structures, intentions and outcomes of the US education systems and some caution is required in the interpretation and subsequent generalisability of this research to the UK. However, the process and experience of learning it can be argued, is universal and it is this generality which underpins the transferability of the lessons learned from international research.

In addition to paper-based publication, research reports are increasingly being made available by institutions via the worldwide web. The growth of institutional websites continues at an alarming pace both in the UK and elsewhere. The worldwide web therefore provides another huge knowledge base for researchers and practitioners with a broad spectrum of potentially relevant institutions ranging from central governments and international agencies to individual professional organisations, research associations and educational providers.

## A note on terminology

Terms used to describe features and aspects of post-compulsory education vary greatly from country to country and a basic understanding of relevant terms is helpful in searching and interpreting reports, articles and papers. Most importantly, the term 'further education' is not generally used within the USA or any other non-UK education system. Searching the ERIC database using this term alone will miss a substantial amount of relevant US literature.

The key descriptor for the United States post-compulsory education system is 'post-secondary education', and, for Australia and New Zealand, 'post-compulsory education' or more specifically 'technical and further education' (TAFE).

Similarly, terms which are used widely within the UK (English and Welsh) FE system, and have specific meaning, may not easily equate to terms used elsewhere. So, for example, in the US literature, 'outcomes' is used in the way in which 'achievement' is currently used in the UK; the term 'retention' is used, but is often used interchangeably with its opposite 'attrition' in the sense of 'drop-out'; and the term 'transfer' can have the same meaning as 'progression' in the UK.

# PART A
# Websites

## Intergovernmental and international

The two principal international or intergovernmental organisations are UNESCO and the OECD. As might be expected, both have extensive websites which outline current research programmes and activities. The UNESCO site covers a wide range of issues concerning education and outlines the research and development programmes which include e-learning, Basic Education for All, and Education for a Culture of Peace. The Renovation of Secondary Education programme has a strand devoted to technical and vocational education with its own subsite. The site gives access to a number of downloadable bibliographies, information and papers from the 1999 International Congress on Technical and Vocational Education and a direct link to the UNEVOC site – UNESCO's international project on improving the quality of technical and vocational provision in member states.

The main OECD site is less useful than that of the Centre for Educational Research and Information (CERI) which is directly relevant. The CERI site outlines the current research programme objectives which include 'Identify significant innovations in education and evaluate "what works"' and 'Analyse and evaluate educational and other innovative strategies for social inclusion'. A number of recent reports and research papers can be downloaded.

While both sites are inevitably limited in the extent to which they focus on directly applicable research, they do give a useful perspective on the international nature of a number of current issues including lifelong learning, disaffection and social exclusion.

## Regional and national

### Europe

Information on the education systems of all EU countries can be accessed through Eurybase. This is an extensive resource, which outlines the structure of the education system at each level, the curriculum and the organisation of funding and research.

The section on the German system gives direct access to the federal government's education research department, the Commission of the Federation and the Länder for Educational Planning and Research Promotion (in English). The German Federal Institute for Vocational Training (BIBB) is concerned with research and development in vocational training. A shortened version of the website is available in English and includes reports of research carried out for the federal government and as part of EU-funded projects. The Institute's newsletter *BIBBnews* can be downloaded from the site.

Although accessing the governmental education department websites of each country is relatively straightforward through Eurybase, locating research beyond this level is more difficult. Several countries, particularly the Scandinavian ones, have an English language version of the site – the Danish Ministry of Education, for example. Most EU countries have a central research agency equivalent to the UK research councils. Several of these have websites with access to a database of funded research within the country. Again, the Danish National Research Database is a good example, as is the Netherlands Institute for Scientific Information Services. The European Current Research Information Systems (EUCRIS) site provides links to these research centres in EU and other countries including Japan.

The Community Research and Development Information System (CORDIS) is a searchable database of largely EU-funded research. It is multidisciplinary and detailed: a search for student achievement found one relevant hit, a Leonardo-funded project at Teesside Tertiary College. Research in specific regions of EU countries can be located via a clickable map.

The Association of European Universities site gives access to the sites of most universities located in Europe. Many of these have opening pages in English but the detailed pages of research programmes revert to the national language.

The European Centre for the Development of Vocational Training (CEDEFOP) is probably the most familiar organisation to UK researchers. The CEDEFOP site provides access to a range of publications and to the journal *Vocational training*. The site has recently been reconstructed as an 'electronic training village' which requires users to register and login, although access to the site itself is free.

### United States

The federal Department of Education is structured as a series of offices and centres, all of which can be accessed directly or via the Department's website.

The Office of Postsecondary Education provides information on policy and funding, as well as information for students on funding and study. The Office of Educational Research and Improvement (OERI) gives access to national education statistics (NCES), including the annual Condition of Education survey,

and to the individual websites of education research centres and programmes.

The National Institute on Postsecondary Education, Libraries and Lifelong Learning (PLLI) is a research centre of the OERI, and is concerned with research and development activities in relation to the education and training of adults in a variety of settings, including post-secondary institutions, the community, libraries and the workplace. It has a major focus on adult literacy. Full-text versions of research reports on higher and vocational education, adult literacy and lifelong learning can be downloaded from the site PLLI supports the following two research and development centres:

- National Center on Postsecondary Improvement (NCPI). The Center's research programme is organised into six topic areas including Student Learning and Assessment, and Professional Development to Enhance Teaching and Learning. There is a subsite for each of the research programme areas, with an outline of the research and downloadable versions of research reports. The Reform and Innovation in Teaching, Learning and Assessment subsite not only provides information on the research programme but also gives details of research findings relating to innovations including Collaborative Learning and Learning Communities with links to other web-based resources.
- National Center for the Study of Adult Learning and Literacy (NCSALL). Full-text research briefs, reports and occasional papers on adult learning are available on the website.

National Center on Postsecondary Teaching, Learning and Assessment (NCTLA) was originally funded as one of the OERI's designated research centres, but is now run jointly by a consortium of universities. The Center has four research programmes, including the Curriculum research programme and the Faculty and Instruction research programme. Summaries of research findings are available but not full-text reports. The publication subsite has abstracts of some useful studies, all of which are priced.

The United States Network for Education Information (USNEI) provides extensive information on the US education system including post-secondary education. The site narrative incorporates hypertext links to many other useful sites.

The American Association of Community Colleges (AACC) is the corporate membership organisation of American two-year colleges. Its website outlines the Association's work and links with government as a lobby organisation. The site has an extensive bookstore, but is disappointingly poor for research and the dissemination of research findings. Selected articles and abstracts from the Community College Journal site are available. The Members subsite gives access to the websites of individual member colleges.

The League for Innovation in the Community College is a key independent organisation for research, development and innovation, principally in US community colleges but it does aspire to an international outlook and representation. It has a broad range of activities including publications and conferences but of particular current interest are the League's three initiatives on leadership, learning and information technology.

The National Center for Research in Vocational Education (NCRVE) was concerned with the promotion of vocational education at both secondary and post-secondary levels. It offered research, training and consultancy services to schools, community and junior colleges, and individuals. The Center closed at the end of December 1999 and has been superseded by the National Research Center for Career and Technical Education and the National Dissemination Center for Career and Technical Education. NCRVE's website provides full text reports on a number of studies produced during the Center's lifetime.

The American Vocational Education Research Association publishes the *Journal of Vocational Education Research* (abstracts for volumes up to 1997 are available online).

The American Technical Education Association publishes the refereed *ATEA Journal* (not available online).

The American Education Research Association is a professional membership organisation for educational researchers. It has an extensive website catering for special interest groups, as well as broader divisions including the post-secondary division. The Association publishes a number of online research journals including *Educational Researcher* and *American Educational Research Journal* (abstracts and/or full-text articles are available). Papers presented at the 1998 and 1997 annual meetings can be accessed via the site.

The Association for Institutional Research (AIR) is a professional membership organisation for people in US higher education who use research for decision making and planning. Its official journal is *Research in Higher Education* which is not available via the website. The organisation also sponsors the online New Directions in Institutional Research which gives coverage to research issues at college level. Registration to receive the AIR newsletter can be made through the site. Papers presented at AIR's annual forum are available online, although the two most recent years are available to members only.

They form an important resource for research into US post-secondary education, although many of them are not on the ERIC database: for example, 'Instructional practices, student preferences, and the gaps between: what predicts student academic success?'

**Australia**

Definitive information about the Australian education system can be found on the Commonwealth Department of Employment, Education and Youth Affairs website. The site also gives access to Education Network Australia (EdNA) which focuses particularly on the application and implementation of ICT, and has similarities with the UK National Grid for Learning. Another interesting point of access to the Australian post-compulsory sector is the Source, a site designed to provide information and resources on further education to young people.

The Office of Post-compulsory Education Training and Employment (PETE) for the state of Victoria has an extensive website which is an extremely useful resource in its own right as well as providing a gateway to other key organisations concerned with post-compulsory education in Australia and beyond. The site gives access to providers of both vocational and community-based training in Victoria, and to information about the Office's publications and research programme. Particularly interesting are the Benchmarking for Educational Effectiveness projects and the Demonstrating Best Practice subsites. The former provides information and resources for a number of benchmarking projects including customer satisfaction and learning strategies, while the Best Practice site publicises and gives details of practice associated with high performance levels in the development and delivery of vocational and educational training. Both sites provide useful resources and project reports.

Several other states and territories have their own regional government websites for technical and further education or vocational education and training.

The Australian National Training Authority is the umbrella organisation for vocational education and training in Australia. Again, it has a substantial website, although it contains very little research. Possibly its major value is its comprehensive Links subsite which incorporates a clickable map of Australia for searching by state.

Australia's two main educational research organisations are the Australian Association for Research in Education (AARE) and the Australian Council for Educational Research (ACER).

AARE is a membership organisation for practitioners and others interested in educational research within the Australian system (the Australian equivalent of the British Educational Research Association [BERA]). The Association publishes the Australian Educational Researcher and the Review of Australian Educational Research, contents and abstracts of which can be accessed through the main site although not full-text copies of articles or papers. Full-text copies are available, however, for papers presented at the Association's annual conference (about 400 individual papers were submitted to the 1999 conference and are included on the website). While a number of these papers address issues in post-compulsory education, their bibliographic control on the website is poor which makes locating them difficult.

ACER is an independent research organisation with a mission to create and disseminate knowledge and tools that can be used to improve learning. There is a substantial website with a considerable number of pages devoted to the Council's research programme. The programme focuses on the five key areas of:

- teaching practices to improve learning
- improving literacy and numeracy learning
- improving vocational outcomes and lifelong learning
- improving outcomes for indigenous students
- assessment and reporting to improve learning.

These are linked by the overarching research question of 'what improves learning outcomes?'

A major plank of the Council's research work in post-compulsory education focuses on the Longitudinal Survey of Australian Youth. Information on the survey and access to the research reports which the it has spawned can be made through the Vocational Outcomes and Lifelong Learning subsite.

The Association of TAFE Institutes represents post-compulsory education institutions in the state of Victoria. Its site provides access to a range of member services including publications, although these tend to have a strategic rather than research focus. Websites of individual members can also be accessed via the site: North Melbourne Institute of TAFE (an urban college) and the South West Institute of TAFE are typical examples.

The Australian Vocational Education and Training Research Association (AVETRA) claims to be Australia's only national, independent association for research in vocational education and training. Its website offers a wide range of resources including online versions of the Association's newsletter and journal, and papers presented at the Association's last three conferences.

The site also has a discussion forum and provides links to approximately 20 other vocational education and training research centres including the Teaching and Learning Centre at Murdoch University, Perth.

The Research Centre for Vocational Education and Training is based at the University of Technology, Sydney. Details and summaries of around approximately 100 research projects completed over the last five years can be accessed through the site including, for example, recent projects titled 'Influences on retention rates in vocational education and training' and 'Self-managed learning as a professional development strategy'. Full-text versions of many of the Centre's working papers can be downloaded from the site, for example, 'Generic Competencies in the Australian Construction Industry'.

**New Zealand**

An extensive outline of the New Zealand tertiary education system is available through the New Zealand Ministry of Education website. The NZ Council for Educational Research is the major independent educational research organisation in New Zealand. The website contains research reports in full text and summaries but little of direct relevance to further education.

**Canada**

As in the USA, the education system of Canada is highly decentralised to state level. Each state has its own governmental education website, good examples of which are Ontario and Saskatchewan. At national government level the post-secondary education subsite of the Council of Education Ministers, Canada provides a number of research reports into policy and strategy. Information on the structure, qualifications and curriculum of the Canadian post-secondary system can be found at the Canadian Information Centre for International Credentials.

The Association of Canadian Community Colleges site gives access to Canadian post-secondary institutions and to the Association's journals and newsletters. The site is, however, disappointing in its coverage of research within the sector. The journals, *ACCC International* and *College Canada*, and the newsletter, *Inside ACCC*, can be accessed directly: all offer articles in full text.

## Individual institutions

As in the UK, most post-secondary/post-compulsory education institutions in other countries have their own websites. Inevitably, these vary in scope, ranging from sites which provide information on courses and application only, to sites which provide access to other student information and resources, and on to sites which include access to institutional research. Institution websites are generally easy to locate via the websites of umbrella associations such as the American Association of Community Colleges, or via the websites of state-level education governance as in Canada and Australia. (A complete list of US post-secondary institutions can be accessed at http://www.utexas.edu/world/comcol/alpha.)

A number of individual institution sites are specifically mentioned in Part B of this report. The LosRios Community College District site is particularly worth visiting as an example of the function of institutional research at a US community college. Also interesting is the Bunker Hill Community College site which is typical of US college websites. It includes standard information about programmes, classes, costs and support for students, and additionally gives access to the College's web-based learning site. The site currently (February, 2001) includes a draft of the College's submission to the regional accrediting organisation, the New England Association of Schools and Colleges. This submission goes into great detail about the structure, organisation and mission of the College, institutional effectiveness systems (quality assurance), student services and the organisation and delivery of the curriculum, including sections on developments to improve the quality of teaching and learning. The extract below forms part of the section on instructional methods and touches on themes which will be easily recognised in a UK context.

> *Innovation in delivering curriculum is an integral part of Programs and Instruction at BHCC. The Classroom Action Research project has helped faculty look closely at their teaching methods to help students become more active, more engaged learners. The Center for Self-Directed Learning, dedicated to providing an alternative to classroom-based learning, was an essential part of the vision of BHCC at its inception and has continued to be an important means of providing options. ... The college offers many options to students to find courses that fit their learning styles. The college deserves high marks in this regard.*
>
> Bunker Hill Community College, 1999

Website references for institutions representative of provision in Canada and Australia (Cumberland Regional College and North Melbourne Institute of TAFE respectively, for example) are included in the website list at the end of this report on page 19.

# PART B
# US post-secondary education research

## The US post-secondary education system

While there are some similarities between post-compulsory education in the USA and the United Kingdom there are a number of fundamental differences, and an understanding of these differences is important if lessons from US research are to be properly interpreted.

The United States Network for Education Information (USNEI) site is an extensive resource for information about all aspects of the US education system including the post-secondary system. It also provides valuable links to organisations both within the USA and outside, including a link to the websites of other national government education services.

### Organisation

- The education system within the United States is highly devolved and decentralised to the lowest organisational level.
- National and federal government power and authority regarding education is limited and is shared with other levels of government and with the private sector.
- Authority in academic matters such as admissions, curriculum, recognition of credentials, graduation and standards is the responsibility of the individual school, district or institution.

### Structure

- The basic post-secondary qualification structure to graduate level comprises a degree obtained after the equivalent of four years of full-time study and associate degree (Associate in Science or Associate in Art) comprising the equivalent of two years of full-time study.
- Additionally, there is a range of other awards including vocational awards which comprise less than two years' study, and certificates and diplomas which may be awarded by individual institutions as an alternative to an associate degree, or to accredit a specialist or technical programme such as computer programming or a foreign language.
- The system distinguishes between two-year colleges which award certificates, diplomas and associate degrees, four-year colleges which offer associate degrees and full bachelor degrees, and universities and other institutions which offer degrees up to masters level and beyond.
- Community and junior colleges are two-year institutions offering programmes to associate degree level often as a precursor to transfer to a degree programme at a four-year college.
- In some states, individual community colleges are organised into 'systems' or 'districts', for example the City University of New York System and the Los Rios Community College District.
- There are approximately 15m individuals enrolled in all types and levels of post-secondary education with approximately 6m enrolled in community and junior ('two-year') colleges.
- Approximately 62 per cent of the 2.5m annual high school graduates enrol in post-secondary education.
- The costs of post-secondary education are paid for by individuals or their families from their own resources and any other special form of support or assistance which may be available.

### Transfer to post-secondary education

- There are no common nationally recognised examinations to mark attainment at the completion of secondary education, although the high school diploma is the standard US school leaving certificate.
- The certificate of general education development (GED certificate) is equivalent to a high school diploma and is awarded to adults who did not complete their secondary education. The GED test comprises a series of five examinations in writing skills, social studies, sciences, literature and the arts, and mathematics. The test measures aptitude in cognitive skills such as evaluation and analysis, as well as factual knowledge. Many two-year colleges offer preparation programmes leading to the completion of the GED certificate.
- Due to the lack of consistency in school leaving qualifications, many colleges require prospective students to do additional tests prior to admission. The scholastic aptitude test (SAT) (see College Board Online) is one frequently used test and is often used as an on-entry variable in research studies.
- Entrance tests such as the SAT are used as predictors of subsequent performance in higher education as well as for diagnosis of likely learning problems or difficulties. Students may be recommended for a developmental or remediation programme before starting their main course as a result of their performance in the entry test.

**Curriculum**

- The curriculum is credit-based and modular. Students gain credit on the basis of course hours completed, with each module having an associated number of credit units. Typically, students complete a minimum of 60 credit units for an associate degree.
- Students studying for an associate degree are required to complete general education modules (liberal arts) as well as the subject-specific modules in which they are majoring. They may also be required to complete 'competency requirements' in writing, reading and mathematics. Some institutions award associate certificates where students are only required to complete courses (units) in the subject in which they are majoring.
- Students' work is graded using either a direct numeric scale or an alphabetic scale which is normalised to a numerical scale. Satisfactory work receives a numeric grade 2.00 (or C). Students are required to maintain a cumulative grade point average (average score in each module they complete) of 2.00 to remain in academic 'good standing'; where students fall below this average they are placed on academic probation. Cumulative grade point averages (CGPA) are frequently used as a key outcome variable in research studies.
- The modular structure of the curriculum means that students can complete their studies part-time and take far longer than the notional two years for an associate degree.
- A good example of how the curriculum is structured and graded can be found on the American River College (California) website.

## Student achievement and success

Student achievement in the US post-secondary system is regarded somewhat differently to that within the English system. These differences are largely accounted for by the structural differences between the two systems. While UK colleges may recognise a wide range of student achievement – for example, non-accredited achievement, value added, individual unit/module achievement, improved self-esteem and self-confidence, etc – overall student achievement tends to be equated with the successful completion of a defined and accredited learning goal.

The devolved and autonomous nature of the US system has allowed institutions to interpret student success in a much more flexible way. There is recent awareness, however, of the need for more robust measures of success. Bers (1997) notes the increasing attention paid to what happens to students in post-secondary education and the increasing accountability for success: 'Among the primary accountability indicators or measures of student outcomes being used are persistence, graduation, and judgements of the effectiveness of programs and services designed to enhance students' achievements and success.'

The ultimate achievement aim for many students undertaking post-secondary education is a bachelor's degree, although many work towards and achieve associate degrees or other certificates. The US system is far less time-constrained than the UK and a characteristic feature of US post-secondary education is the frequency with which students will move in and out of programmes as finance, work commitments and other circumstances permit (Cuccaro-Alamin, 1997, p17).

In recent years there has been a move towards the identification and definition of a number of accepted outcomes for students participating in the post-secondary system. In work sponsored by the National Center for Education Statistics, Terenzini and others have developed a definition of student outcomes and an associated taxonomy. 'The Working Group uses "outcome" to refer to those education-related consequences of students' postsecondary educational experience' (Terenzini, 1997).

Terenzini's group identified three dimensions of student outcome:

- academic
- developmental
- occupational.

It also identified four sets of student goals:

- educational success
- success in transitions
- economic impacts
- quality of life.

In the absence of an agreed definition of achievement or success, earlier US research studies have tended to define achievement in their own terms. A number of studies have sought to classify and define student outcomes. Claggett (1996) designed a student outcomes typology for use in studies of student achievement at one community college. The seven categories were:

- award and transfer
- transfer/no award
- award/no transfer
- sophomore status in good standing
- persisters
- non-achievers

- special motive (non-degree-seeking students with short-term goals – excluded from achievement studies).

The first four categories are aggregated to produce a summative achievers group. The same typology (slightly modified) has been used in at least one other achievement study (Lajubutu and Yang, 1998).

## Underprepared students and remediation

The notion of the underprepared student unable to make the transition to higher academic study is widely accepted within the US post-secondary system. Underprepared students are often, though not always, classified as 'at risk', a term used across all phases of the US system and not solely confined to post-secondary education as it is here. In recent years a range of remedial or developmental programmes has been developed for these students, and, although they are offered at most two- and four-year colleges, there is some debate as to whether they should be compulsory for students diagnosed as needing extra help in making the transition to higher level study (Boylan and Saxon, 1999).

> *Many students enter post-secondary institutions lacking the reading, writing, or mathematics skills necessary to perform college-level work. Therefore most institutions enrolling freshmen offer remedial courses to bring those students' skills up to the college level. While some consider remedial courses as one way to expand educational opportunities for students with academic deficiencies, others feel that precollege-level instruction should be eliminated or strictly limited in four-year institutions.*
>
> National Center for Education Statistics, 2000, p81

Part of the debate about the provision of remedial or developmental programmes for underprepared students revolves around the costs of provision, particularly in relation to individualised programmes. 'Individually designed programs may prove more successful, but they could also prove more costly since they become increasingly labor-intensive as additional teachers, counselors and trained tutors would be required' (Popejoy, 1994).

Concern for cost-effectiveness has led a number of colleges to look carefully at and evaluate alternative approaches to programmes for underprepared students. Popejoy (1994) outlines a strategy used at one community college: the Student Centred Process Coordination Model. The college identified six key factors which needed to be addressed if students were to complete developmental programmes successfully:

- the relationship between students and teachers. Teachers are seen as providing motivation and support for students while at the same time being empathetic to the range of problems which students face
- the supportive role of the family, family educational history and experience and the socio-economic background from which students come. Popejoy quotes research which demonstrates that students can overcome a variety of obstacles and barriers to successful course completion but often not without support from college staff and strong personal commitment
- the importance of building student self-esteem. 'If no-one else believes in the student, the student must believe in him or herself, and sometimes that belief system grows from the belief and encouragement of one significant teacher.' Building intrinsic motivation through goal setting, time management and personal development among other things is seen as critical
- the development of a supportive campus environment and atmosphere to counteract the anxiety that many underprepared students face
- close links between developmental programmes and mainstream college courses, and equity in programme status. The stigma attached to 'remediation' is noted
- availability of other college support staff, particularly peer tutors and counsellors.

In their synthesis of research into effective developmental programmes, Boylan and Saxon (1999) identify a number of characteristics which would be recognisable as key components of basic skills provision here: clearly specified goals and objectives, the integration of classroom and laboratory (compare with vocational workshop) provision, the need for ongoing support from specialist, trained tutors, and the use of a variety of approaches and instructional methods which meet the needs of individual students. They also identify a number of other characteristics of effective programmes which particularly relate to teaching and learning.

Citing work by Roueche and Roueche (1993), Cross (1976) and others, they note the use of 'mastery learning' as a component of effective developmental programmes. Mastery learning is characterised by an emphasis on learning facts and knowledge; it uses small units of learning and frequent testing. Students do not move onto a new unit of learning until they have mastered the current one. Use of mastery learning techniques leads to a greater likelihood of passing remedial programmes,

a view supported by their own research at a Texas community college (Boylan et al, 1996).

The use of learning communities, where students are grouped together as a cohort around courses linked together by a common theme, results in improved performance and higher student satisfaction. A parallel might be drawn with generic entry and Level 1 programmes in the UK where students follow a basic skills core but opt for a range of vocational tasters or longer programmes.

Other successful strategies which Boylan and Saxon identify include supplemental instruction where small-group follow-up sessions are used to reinforce blocks of learning; strategic learning where students are encouraged to think about how they learn best (metacognition); and use of computer-based learning to supplement classroom activity.

Finally, they note the use of student learning styles analysis as an aid to planning effective learning activities. From a number of studies, they note that students on developmental programmes tend to have visual or hands-on approaches to learning (presumably as opposed to auditory approaches), and that students are more likely to be successful where a variety of teaching methods is used to address these learning styles.

Responding to concerns about the cost-effectiveness of developmental programmes for at-risk students, Boylan (1999) suggests that a number of the preceding strategies can be used as the basis for alternative provision. Two strategies – critical thinking instruction and strategic learning – focus on helping students to develop underpinning cognitive and learning skills as a foundation for effective learning in a range of subjects.

Boylan cites a programme at LaGuardia Community College which integrates critical thinking into the reading, writing and communications elements of developmental programmes. A number of studies have shown that the development of critical thinking skills enhances students' reading and writing skills, their attitude to learning and their ability to undertake research for class assignments.

Learning skills strategies focus on the development of learning skills including study skills, motivation and time management. Students learn how to match learning strategies to their own learning goals and the demands of the task, and, as they develop their expertise in strategic learning, they are better able to identify learning-related problems and to develop alternative learning plans. Research suggests that the benefits of strategic learning last into the long term.

'Freshman seminars' have been developed at a number of institutions as more substantial induction programmes spanning an entire academic term. The orientation programme focuses on making the transition to college life and the development of learning skills. Programmes are often credit-based and form an integral part of a student's course. Research points to the impact of freshman seminar programmes on improved retention.

The National Center for Developmental Education website is a useful source of further information on the provision of remedial and developmental programmes within the USA. The site gives access to a number of relevant research publications and outlines the Center's current research programme.

## Basic skills

Several studies focusing on retention, persistence and achievement have examined the impact of basic skills, generally defined in the USA as mathematics, writing and reading. Many of these studies point to the significance of mathematical skills as a predictive factor in persistence and success within the US system, a finding confirmed statistically by the Condition of Education, 2000 survey (NCES, 2000, p52).

In fact, the whole area of remedial or developmental education attracts a higher profile partly due to the significance of the GED certificate as a basic skills qualification in its own right and as an entry certification to a bachelor's programme for students who do not possess a high school diploma. Three partly related studies illustrate the concern for basic skills development and their power in predicting retention and achievement.

Claggett's (1996) study tracked 2643 students, all of whom were first-generation participants in post-secondary education, over a four-year period. Outcomes for each student were classified using the outcomes typology, and correlated against a number of variables including placement test scores (initial assessment), attendance patterns and ethnicity.

Those students who undertook all recommended developmental work as a result of initial assessment achieved at the same rate as those students for whom no developmental work was needed (46 per cent). This contrasted with those students who failed to take up developmental support, where achievement was only 21 per cent.

Claggett's findings in relation to maths needs are also supported by two further studies.

Windham (1995) studied 1425 first-time students over a two-year period at a Florida community college and identified four outcome variables associated with persistence:

- still enrolled at the college one year after initial enrolment

- still enrolled at the college after initial enrolment
- enrolled elsewhere one year after initial enrolment
- enrolled elsewhere two years after initial enrolment.

The outcome variables were correlated against a number of independent variables including demographic, employment and basic skills sets. Three individual (independent) variables and one set of variables had significant correlations with all four outcome variables. 'The individual variables were age at time of entry, grade point average earned during the first semester and score on the mathematics segment of the Multiple Assessment Placement Skills (MAPS) test' (Windham, 1995).

Some independent variables – the writing segment of the MAPS test and the type of high school diploma earned – correlated only with the first-year dependent variables, suggesting different reasons for first- and second-year drop-out. As a set, the employment variables correlated with all four dependent variables with students working full-time having a 66 per cent likelihood of dropping out. Somewhat perversely, as an overall predictor of retention, there was a negative relationship between scores on the writing segment of the MAPS test and longer-term enrolment.

As a result of the findings, the college re-examined the level of the threshold score in maths against which recommendation for placement on some kind of preparatory or remedial programme was made. This might run in parallel with the main programme or as a prerequisite for progression onto it.

Bers' (1997) study was carried out at an 'affluent midwestern suburban' college and, as in the two previous studies, used a variety of statistical analyses to identify factors which influenced academic outcomes. The study particularly sought to examine the accuracy of students' own perceptions of their basic skills abilities.

A sample of 602 students was asked to complete a self-perception inventory in addition to standard placement tests. The inventory was completed before students knew the test outcomes.

The study found that students' self-perceptions of basic skills were overstated. Twenty-one per cent of students who were placed into additional maths self-rated their maths skills as high (on a scale of 1=poor to 5=excellent in response to the prompt 'Successful completion of college courses requires many skills. Please rate yourself on these skills'). Sixty-two per cent of students overrated their reading skills on the same basis, and 60 per cent their writing skills. In general, students' own perceptions of their basic skills were not adequate predictors of successful academic outcomes.

In common with both Claggett and Windham, statistical analysis of variables indicated that score in maths assessments was a strong predictor of academic achievement in terms of cumulative grades (the US system is largely credit-based; see the third Lesson from US research in Part C on page 14 and cumulative enrolment. Interestingly, Bers notes that maths skills may well be a proxy for a number of other requisite skills for academic study in post-secondary education: 'It may be that mathematics competency as reflected by placement results is a proxy measure for other attributes, such as commitment to academics or study skills and discipline' (p113).

In outlining recommendations from the study, Bers points to the importance of formally and informally assessing basic skills and assisting students to realistically self-assess their own basic skills competencies. She also notes the importance of induction: 'One of the primary values of Orientation Sessions for new students might be, then, to engage participants in a variety of exercises that force them to check their own perceptions about skills and motivations against reality' (p114).

In appreciating the significance of the findings of the three studies it is worth noting that all three were carried out at community colleges with 'open-door' enrolment policies. Attainment at a prescribed level in maths and English is therefore not an entry requirement for a programme of study as it might well be in the UK, and therefore the initial diagnosis of basic skills levels is all the more important.

## Teaching and learning

Although there are a substantial number of US research reports on teaching methods and learning strategies in post-secondary education, many are purely descriptive and provide limited empirical evidence of the impact of new strategies on student outcomes. While the literature does provide a rich source of ideas on new strategies – including, for example, learning communities, peer assisted teaching and mastery learning – it is disappointingly poor in evaluating the impact of these new approaches on students' achievements. Beachler and Glyer-Culver (1998) review a number of recent innovations in teaching and assessment, including the increasing use of cooperative or collaborative learning strategies in US community colleges. Boylan (1999) and Boylan and Saxon (1999) also review a range of approaches to teaching and learning which have resulted in improvements in student outcomes in developmental education programmes.

In essence, cooperative learning and the closely related approach termed 'collaborative learning' would be widely recognised in the UK as small group work. However, the US approaches are characterised by a more structured use of group work to achieve individual learning objectives and to encourage greater learner autonomy. Foote (1997) defines collaborative learning as 'the instructional use of small groups' with the objective of allowing students to 'work together to maximise their own and others' learning'. The approach is characterised by the presence of five components:

- clear, positive interdependence among students
- regular group self-evaluation
- behaviours which promote each member's learning and success
- individual accountability and responsibility
- development and use of interpersonal and small group social skills.

Foote reviews the use of collaborative learning in courses at five community colleges. The approach resulted in a number of quantitative and qualitative improvements in attitude, behaviour and performance, although in one study there was no difference in overall outcome between students taught using collaborative approaches and those taught with more traditional methods.

Hill (1996) reports a study at Florida Community College in which staff were given intensive training in the use of cooperative learning as a means of changing classroom culture. The project, which ran over three years, resulted in improvements in achievement, attendance, development of critical thinking skills, team working and relationships between students and staff.

Four meta-studies of cooperative learning approaches are reported by Beachler and Glyer-Culver (1998). They note that research on cooperative learning at college level is less extensive but is nevertheless consistent with findings from other education sectors in the USA. They refer to work by Slavin (1991) which showed that positive benefits associated with raised self-esteem, improved attitude to education and improved interpersonal skills emerged in 63 per cent of studies. Other studies have found that cooperative learning resulted in higher individual achievement than did competitive or individual learning. It also resulted in greater motivation to learn, more effective use of cognitive skills and increased retention.

Learning communities reflect the use of cooperative learning at course level, with an emphasis on group development and support. Rather than enrolling and studying on an individual basis, students enrol in a learning community which is based around a number of linked courses. (Course in this sense refers to an individual unit, not a programme leading to a qualification aim as in the UK.) As Boylan and Saxon (1999) report, learning communities have been used as a means of improving achievement in developmental programmes. Tinto and Love (1995) undertook a longitudinal study of the development of learning communities at LaGuardia Community College. Their study used quantitative and qualitative approaches to examine the impact of the learning community approach over traditional methods. They found that students in the learning community gained higher grade point averages and more credits than students taught traditionally, and that students reported positive attitudinal and behavioural benefits. An example of a learning community programme can be found on the American River College website.

## Research methodologies

The literature search carried out for this review supports the premise that there is a far greater volume of practitioner-focused research with direct practical application in the United States than in the UK. However, given this proliferation it would be reasonable to question the quality of some of the methodologies used and the validity and reliability of the findings. Approximately two-thirds of the articles used in this review come from peer-reviewed or edited journals, or have been presented as papers at major national conferences and may therefore be assumed to be methodologically sound. Most of the rest are published by individual institutions but, nevertheless, show rigour in their design and analysis.

Many studies adopt quantitative designs where a range of dependent and independent variables are identified, measured and analysed using statistical techniques such as analysis of variance or multiple regression. The most frequently used dependent variables are grade point average as a measure of achievement, and total credits gained or semesters completed as measures of persistence. Studies use a wide range of independent variables depending on the focus. Independent variables may be gathered via Lickert-type questionnaires (Osborne, 1997) or use a range of existing statistical and numeric data. Wyman's (1997) study of predictive factors for student retention builds a regression model using 148 independent variables based on a core set of 21 existing data measures to conclude that only two have a significant impact on first-year retention!

The more robust studies consider the validity of choice of variable, statistical significance, error and power, and use of control groups as comparators. A number of the studies reviewed here make extensive use of statistical analysis including the three basic skills studies and Lajubutu and Yang's (1998) study of predictive factors for student success.

As well as purely quantitative approaches, many other methodologies are evident in the literature. These include meta-analyses and literature syntheses (Boylan and Saxon, 1999; Beachler and Glyer-Culver, 1998), case studies and attitude surveys.

Another widely used methodology is the cohort study, which assumes particular significance given the timescale over which many students complete their qualification. The annual Condition of Education survey published by the US Department of Education draws heavily on longitudinal, cohort studies. Many of the detailed studies on which the Condition of Education survey is based are published separately (see for example, Berkner et al, 2000). An outline of the National Center on Postsecondary Teaching, Learning and Assessment's three-year National Study of Student Learning can be found at the Center's website.

The overarching aim of this study is to identify research outside the UK on student achievement in post-secondary/post-compulsory education available through the internet. Search engines are of limited value as a search tool because of their emphasis on recall rather than precision, and because of the sheer amount of diverse information available. It has proved necessary, therefore, to approach possible sources of information in a more systematic way, bearing in mind the structure and organisation of not only educational research in other countries, but also the structure of the education systems themselves.

A good deal of institution-level research can be accessed through the main educational bibliographic databases: ERIC and, to a far lesser extent, the British Education Index (BEI). ERIC is freely accessible via the internet; BEI only via direct subscription or through academic institutions on the Bath Information and Data Services (BIDS) system. Part B of this study has reviewed some of the US institution-level research accessed through ERIC to give an idea of its scope and value to UK researchers. What is far less easy to access is similar institution-level research from northern Europe.

Following the discussion in the previous section, it is possible to identify:

- the relevance of some of the research findings from North America to British post-compulsory education
- some British research priorities
- ways in which British research can be informed by and develop from contemporary American research.

# PART C
# Indicators for further research

## Lessons from the US research

**1. Developmental programmes and underprepared students**

Largely because of the inconsistency of the high school diploma as an indicator of preparedness for college level, US community colleges value placement testing and provision of developmental programmes for students who are not able to reach a threshold. There seems to be a greater acceptance that the transition from school to college is not automatic.

Evidence gained from recent work in a number of colleges shows some teachers in the UK are thinking carefully about the provision of bridging programmes for students with marginal GCSE grades (Cs and Ds) who are unable to access Level 3 vocational programmes. This is partly because of the difficulty in making the transition from school study to college study. For example, Greenwich College has reintroduced the BTEC first diploma in health and social care as a bridging programme to the GNVQ Advanced not so much because of the content but because of the preparation it gives for studying at Level 3. This intermediate provision is claimed to result in better retention and achievement as students move through their Level 3 programme.

There are many anecdotal instances of students not coping with a vocational programme at a particular level, not because of the vocational content, but because they do not have the right underpinning skills to access parts of the curriculum at the time they're delivered. Work on curriculum/generic skills by colleges such as York and Shrewsbury have highlighted this problem. Again, what many students seem to need is a front-loaded or preparatory programme to ensure they have the right underpinning or generic skills to cope with the main parts of their programmes.

Until now, the development of short bridging programmes for underprepared students has largely been prohibited because of the relationship between funding and qualification aims. A new funding methodology opens up new possibilities, however. It seems timely, therefore, for research into the provision, funding and curriculum content of preparatory programmes and their impact on retention and achievement as students progress to higher level study.

**2. Basic maths skills**

A finding which emerges strongly from the review of the three studies into basic skills outlined above, is the value of students' attainment in maths as a predictor of longer-term retention and achievement. Bers' finding that maths seems to be a proxy measure for other attributes is also interesting. All three studies resulted in greater emphasis on maths skills in their developmental programmes.

Initial assessment (and diagnosis) is now accepted practice for identifying the basic skills support needs of many students. Those who need very specific learning support in numeracy are referred for additional help. There are, however, many students whose numeracy skills do not fall below Level 1 but who nevertheless need help in maths if they are to cope successfully with their course. (Students on a GNVQ Hospitality and Catering programme would be a good example.) Although key skills in application of number do allow students to develop their numeracy skills, the structure of key skills delivery in many colleges means that students are not able to acquire the right skills at the time when they are most needed. Furthermore, the new basic skills standards (even though they are notionally targeted at adults) may more adequately define the specific set of skills which students need at Level 1 or 2 in relation to vocational curricula.

More information is needed on the contribution of maths skills to overall student achievement and on the best ways of enabling students to acquire the specific course-related maths skills they need to make progress. Assumptions made about the adequacy of application of number to cover these skills also need testing in practice.

**3. Impact of modularisation on retention**

The modular credit-based structure of the US post-secondary system means that student retention is a problem in the extent to which students complete a sequence of courses (modules). It is more a matter of getting students to re-enrol to continue their studies, rather than retaining them on a course once they have enrolled. Possibly this has to do with the financial commitment which students make, although it is difficult to be certain on the limited basis of the research reviewed here.

Nevertheless, we are beginning to see the disaggregation of programmes here into modules, and the concept of lifelong learning assumes that people will make a longer-term commitment to study with periodic enrolment onto courses. We may, therefore, become increasingly familiar with retention problems of the US kind as well as the ones which we have been used to here in recent years.

Lessons and strategies from the US experience might help pre-empt emerging problems within the learning and skills sector in England and Wales.

**4. Research methodology**

The studies reviewed here are generally characterised by a considered use of research methodology. A number use specific quantitative techniques to test assumptions about the relationship between variables, and the literature reviews have stated criteria for the inclusion of research findings. They are, therefore, reasonably defensible in terms of the reliability and validity of their findings and consequently the extent to which these can be generalised.

The current Raising Auality and Achievement (RQA) development projects also use a variety of methodologies although there is considerable variation in the rigour with which the methodology is chosen and applied. While valuable as individual case studies, these projects are more open to challenge in terms of reliability and validity, and there is a limit to the generalisability of their findings both within individual colleges, across colleges, and over time. However, because of the number of projects completed, the findings have served to extend and enrich the conclusions of more rigorous pieces of research work such as *9000 voices* (Martinez and Munday, 1998).

Nevertheless, if the sector is to build research capacity, colleges and individual practitioners need to be skilled in their ability to plan and carry out high-quality research which is reliable and valid in its choice of methodology, and therefore has greater utility in the application of its findings.

**5. Maintaining links to useful websites**

The study has highlighted a considerable number of links to websites which have broad relevance to improving teaching and learning and the quality of student achievement in post-secondary education. They form a useful resource for researchers, practitioners and others but they do, however, change and develop very rapidly and useful new sites emerge regularly. The resource needs maintaining and this could be done through the library and information services at the Learning and Skills Development Agency and made available via the Agency's website.

**6. Disseminating UK further education research through ERIC**

Although the RQA website gives access to development projects and the Learning and Skills Development Agency's website gives access to British research, the bibliographic control of this information is poor. Encouraging colleges and other institutions to submit research reports to the ERIC clearinghouse for inclusion on the ERIC database would raise the profile of practitioner research within the sector, make it more widely available and improve its accessibility.

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# Selected websites

ACCC International
http://www.accc.ca/international/

American Association of Community Colleges (AACC)
http://www.aacc.nche.edu

American Educational Research Association (AERA)
http://www.aera.net

AERA Educational Researcher
http://www.aera.net/pubs/er

AERA American Educational Research Journal
http://www.aera.net/pubs/aerj

American River College
http://arc.losrios.cc.ca.us

American Vocational Education Research Association
http://www.coe.missouri.edu/~pavtat/AVERA

Association for Career and Technical Education
http://www.acteonline.org

Association for Institutional Research (AIR)
http://www.airweb.org/

Association of European Universities
http://www.unige.ch/cre

Association of Canadian Community Colleges
http://www.accc.ca/english

Association of TAFE Institutes
http://www.ati.edu.au

Australian Association for Research in Education (AARE)
http://www.swin.edu.au/aare

Australian Council for Educational Research (ACER)
http://www.acer.edu.au

Australian National Training Authority
http://www.anta.gov.au/default.htm

Australian Vocational Education and Training Research Association (AVETRA)
http://www.avetra.org.au

Bath Information and Data Services (BIDS)
http://www.bids.ac.uk

Benchmarking for Educational Effectiveness Projects
http://www.otfe.vic.gov.au/public/beep/index.htm

Bunker Hill Community College
http://www.bhcc.state.ma.us/contents.htm

Canadian Information Centre for International Credentials
http://www.cicic.ca/postsec/index.stm

Centre for Educational Research and Information (CERI)
homepagehttp://www.oecd.org/els/edu/ceri/index.htm

College Board Online
http://www.collegeboard.org/

College Canada
http://www.accc.ca/CollegeCanada/index.asp

Commission of the Federation and the Länder for Educational Planning and Research Promotion
http://www.blk-bonn.de/

Commonwealth Department of Employment, Education and Youth Affairs (DEETYA)
http://www.deetya.gov.au

Community College Journal
http://www.aacc.nche.edu/books/journal/journalindex.htm

Community Research and Development Information System (CORDIS)
http://www.cordis.lu/en/home.html

Cumberland Regional College
http://www.cumberlandcollege.sk.ca

Danish National Research Database
http://www.forskningsdatabase.dk/uk/indexuk.htm

Demonstrating Best Practice
http://www.otfe.vic.gov.au/bestprac/index.htm

Department of Education (USA)
http://www.ed.gov/

Education Network Australia (EdNA)
http://www.edna.edu.au/EdNA

ERIC (Educational Resources Information Center)
http://accesseric.org

European Centre for the Development of Vocational Training (CEDEFOP)
http://www.cedefop.gr

European Current Research Information Systems (EUCRIS)
http://www.nsd.uib.no/english/research/eucris/

Eurybase
http://wwweurydice.org/Eurybase/Application/eurybase.htm

GED certificate preparation programme
http://www.stcc.mass.edu/testing/ged.html

German Federal Institute for Vocational Training (BIBB)
http://www.bibb.de/aktuell/fram_engl.htm

Inside ACCC
http://www.accc.ca/pubs/InsideACCC/

Knowledge bases for education
http://www.oecd.org/els/edu/cerl/Objective/3/factsheet.htm

League for Innovation in the Community College
http://www.league.org

Learning and Skills Development Agency
http://www.LSagency.org.uk

Los Rios Community College District
http://irweb.do.losrios.cc.ca.us/

Ministry of Education (Denmark) Home Page
http://www.uvm.dk/eng

Ministry of Education (New Zealand)
http://www.education.govt.nz/

National Center for Developmental Education
http://www.ced.appstate.edu/centers/ncde

National Center for Research in Vocational Education
http://ncrve.berkeley.edu

National Center on Postsecondary Improvement (NCPI)
http://www.stanford.edu/group/ncpi

National Center on Postsecondary Teaching, Learning and Assessment
http://www.ed.psu.edu/cshe/htdocs/research/NCTLA/nctla.htm

National Center for the Study of Adult Learning and Literacy (NCSALL)
http://gseweb.harvard.edu/~ncsall

National Education Statistics (NCES) USA
http://nces.ed.gov/

National Institute on Postsecondary Education, Libraries and Lifelong Learning (PLLI)
http://www.ed.gov/offices/OERI/PLLI

National Research/Dissemination Centers for Career and Technical Education
http://www.nccte.com

Netherlands Institute for Scientific Information Services
http://www.niwi.knaw.nl/us/homepag.htm

New Directions in Institutional Research
http://www.jbp.com/JBJournals/ndir.html

New England Association of Schools and College (NEASC)
http://www.neasc.org

NZ Council for Educational Research
http://www.nzcer.org.nz/

Non-US Education Systems (Intl + National)
http://www.ed.gov/NLE/USNEI/HP2A2.html

North Melbourne Institute of TAFE
http://www.nmit.vic.edu.au/

OECD
http://www.oecd.org/els/

Office of Educational Research and Improvement (OERI)
http://www.ed.gov/offices/OERI

Office of Post-compulsory Education Training and Employment (PETE)
http://www.otfe.vic.gov.au

*Office of Postsecondary Education*
http://www.ed.gov/offices/OPE

Ontario Ministry of Education
Post-Secondary Education
http://www.edu.gov.on.ca/eng/general/postsec/postsec.html

Raising Quality and Achievement (RQA)
http://www.rqa.org.uk

Reform and Innovation in Teaching, Learning and Assessment
http://www.umich.edu/~ncpi/53/randi.html

Research Centre for Vocational Education and Training
http://www.rcvet.uts.edu.au

Saskatchewan Post–Secondary Education and Skills Training
http://www.sasked.gov.sk.ca/P/index.html

South West Institute of TAFE
http://www.swtafe.vic.edu.au/

Technical and Further Education (Australia and International)
http://www.otfe.vic.gov.au/links/index.htm

the Source
http://www.thesource.gov.au/

UNESCO current programmes and activities
http://www.unesco.org/education/educprog/prog_idx.htm

UNEVOC
http://www.unevoc.de/

United States Network for Education Information (USNEI)
http://www.ed.gov/NLE/USNEI/US/
http://www.ed.gov/NLE/USNEI/international/

Vocational Education and Training (Denmark) Factsheet
http://www.uvm.dk/eng/publications/factsheets/fact3.htm

What works in innovation in education
http://www.oecd.org/els/edu/ceri/Objective/4/factsheet.htm

This report is designed to help practitioners and researchers find and use Internet-based resources that deal with raising achievement. It contains a guide to useful research sources and organisations accessible via the Internet; an introductory synthesis of research findings drawn from the Educational Resources Information Center (ERIC) and suggestions for applying American research findings to raising achievement in the UK.

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